

COURSE OUTLINE

SUBJECT: LIVING SCIENCE

GRADE: 7

Curriculum reflects NYSSLS and MYP Learning Criterion

Anticipated student outcomes:

By June of the school year, students in this class should be able to understand and have knowledge of:

Structure, Function, and Information Processing

- Plan and conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells
- Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function
- Construct an explanation supported by evidence for how the body is composed of interacting systems consisting of cells, tissues, and organs working together to maintain homeostasis.
- Gather and synthesize information that sensory receptors respond to stimuli, resulting in immediate behavior and/or storage as memories

Matter and Energy in Organisms and Ecosystems

- Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
- Develop a model to describe how food molecules are rearranged through chemical reactions to release energy during cellular respiration and/or form new molecules that support growth as this matter moves through an organism.
- Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
- Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

Interdependent Relationships in Ecosystems

- Construct an explanation that predicts patterns of interactions among organisms in a variety of ecosystems
- Evaluate competing design solutions for maintaining biodiversity and protecting ecosystem stability.

Growth, Development, and Reproduction of Organisms

- Use arguments based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants, respectively.
- Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
- Develop and use a model to explain why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.
- Develop and use a model to describe how asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation
- Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.

Natural Selection and Adaptations

- Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.
- Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.
- Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.
- Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.
- Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

Materials required:

1. Composition notebook
2. Agenda book
3. Pen and pencil
4. Chromebook

Criteria for grading:

Students will be graded using the averaging system. Students' grades will reflect their class participation, quizzes, homework, labs, projects and tests.

The course also engages the four IB Middle Years Program (MYP) learning and assessment Criteria.

Criterion A –Knowing & Understanding – through classroom presentations, demonstrations and evaluations

Criteria B and C – Inquiring & Designing and Processing - Evaluating by means of hands-on lab activities

Criterion D – Reflecting on the Impacts of Science through student-created presentations, projects, and reflective pieces.

Outline developed by: Science Department

Date: Spring 2025